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| 10/077,639 | 02/15/2002 | Hidekazu Shirakawa | NEC 01FN073 | 5470 |
| 27667 | 7590 | 08/30/2007 | | |
| HAYES SOLOWAY P.C. 3450 E. SUNRISE DRIVE, SUITE 140 TUCSON, AZ 85718 | | | EXAMINER PATEL, GAUTAM | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | | |
|------------------------------|-------------------------------|----------------------------------|--|
| Office Action Summary | Application No. 10/077,639 | Applicant(s) SHIRAKAWA ET AL. | |
| | Examiner Gautam R. Patel | Art Unit 2627 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 August 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,5-9 and 11-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 5-9 and 12-15 is/are allowed.
- 6) ☐ Claim(s) 1-2, 11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Response to Amendment

1. This is in response to amendment filed on 8/10/07.
2. Claims 1-2, 5-9 and 11-15 remain for examination.

Claim Rejections - 35 U.S.C. § 103

3. The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 2 and 11 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Kikuchi US. patent **6,353,582** (hereafter Tateishi).as in view of Tateishi et al., US. patent 6,584,048 (hereafter Tateishi).

As to claim 1, Kikuchi ['582] discloses the invention as claimed [see Figs. 1, 4-7] including an objective lens, a signal detector and a thickness error detector, comprising:

an objective lens [fig. 1, unit 14] for condensing light for recording or reproducing information on said recording layer [fig. 1, unit 15] via a transparent substrate [fig. 1, unit 15's transmission substrate] of the optical disk [col. 2, line 61 to col. 3, line 13; col. 5, lines 14-48];

a signal detector [fig. 4, units 31-34 & FE1 & FE2] for detecting a focus error signal from all rays [disc 15 does return all rays] of return light reflecting from said recording layer [col. 2, line 61 to col. 3, line 13; col. 5, lines 14-48]; and

a thickness error detector [fig. 4, units 33, 36, 38-39] for detecting thickness errors [Thickness error signal TH] of said transparent substrate with reference to a specified value, based on the characteristics of said focus error signals [col. 2, line 61 to col. 3, line 13; col. 4 lines 3-45].

As to claim 1, Kikuchi discloses all of the above elements, including aberration correction caused by the thickness variations of the transmission [transparent] substrate and detection of focus error signal and focus sum signals.

Kikuchi does not specifically disclose that these signals are detected by the well known knife-edge method [or by difference between positive peak and negative peak] to the extent claimed.

However, knife-edge method, or calculating difference between absolute value of positive peak and negative peak, has been well known in the art for a very long time and is not patentable idea as such [see US patent 5,136,566; col. 4, lines 1-11. Also see US 4,974,220; col. 4, lines 10-42 and fig. 3]. Especially US patent 6,031,792 which discloses thickness error detection based on difference between absolute value of negative and positive peak of focus error signal [see BSTX (17)].

More importantly, Tateishi clearly discloses:

Focus error based on difference between the absolute value of positive peak and the absolute value negative peak of said focus error signal [col. 10, lines 40-61, col. 11, lines 17-45; col. 12 lines 9-45 and fig. 5].

Both Kikuchi and Tateishi are interested in improving the focus error detection mechanism in an optical disk device.

One of ordinary skill in the art at the time of invention would have realized that the system of Kikuchi would be sensitive vibration of the disc surface and any extraneous noise would have compromised the quality of the electrical signals.

Therefore, it would have been obvious to have used a knife-edge method in the system of Kikuchi as taught by Tateishi because one would be motivated to reduce noise in the system of Kikuchi and provide better signal controls and improve quality of the signal and provide over all better control of the system [col. 2, lines 14-21; Tateishi].

4. The aforementioned claim 2, recites the following elements, inter alia, disclosed in Kikuchi:

an objective lens [fig. 1, unit 14] for condensing light for recording or reproducing information on said recording layer [fig. 1, unit 15] via a transparent substrate [fig. 1, unit 15's transmission substrate] of the optical disk [col. 2, line 61 to col. 3, line 13; col. 5, lines 14-48];

a signal detector [fig. 4, units 31-34 & FE1 & FE2] for detecting focus error signals and focus sum signals from return light reflecting from said recording layer [col. 2, line 61 to col. 3, line 13; col. 5, lines 14-48]; and

a thickness error detector [fig. 4, units 33, 36, 38-39] for detecting thickness error [Thickness error signal TH] of said transparent substrate [col. 2, line 61 to col. 3, line 13; col. 4, lines 3-23; and col. 5, lines 14-48].

Kikuchi discloses all of the above elements, including aberration correction caused by the thickness variations of the transmission [transparent] substrate and detection of focus error signal and focus sum signals.

Kikuchi does not specifically disclose that these signals are detected by the well known knife-edge method [or by difference between positive peak and negative peak] or based on a difference between the focus position of the peak point of said sum signal and the focus position of the zero point of said focus error signal to the extent claimed.

However, knife-edge method, or calculating difference between absolute value of positive peak and negative peak, has been well known in the art for a very long time and is not patentable idea as such [see US patent 5,136,566; col. 4, lines 1-11. Also see US 4,974,220; col. 4, lines 10-42 and fig. 3]. Especially US patent 6,031,792 which discloses thickness error detection based on difference between absolute value of negative and positive peak of focus error signal [see BSTX (17)].

More importantly, Tateishi clearly discloses:

detecting thickness error based on a difference between the focus position of the peak point of said sum signal and the focus position of the zero point of said focus error signal [col. 10, lines 40-61, col. 11, lines 17-45; col. 12 lines 9-67 and fig. 8-9].

Both Kikuchi and Tateishi are interested in improving the focus error detection mechanism in an optical disk device.

One of ordinary skill in the art at the time of invention would have realized that the system of Kikuchi would be sensitive vibration of the disc surface and any extraneous noise would have compromised the quality of the electrical signals.

Therefore, it would have been obvious to have used a knife-edge method in the system of Kikuchi as taught by Tateishi because one would be motivated to reduce noise in the system of

Kikuchi and provide better signal controls and improve quality of the signal and provide over all better control of the system [col. 2, lines 14-21; Tateishi].

5. The aforementioned claim 11, recites the following elements, inter alia, disclosed in Kikuchi:

a spherical aberration compensator [fig. 1, unit 13, the collimator lens] for compensating for spherical aberration caused by the thickness error of said transparent layer [col. 5, lines 41-48].

6. Applicant's arguments filed on 8/10/07 have been carefully and fully considered but they are not deemed to be persuasive for the following reasons.

In the REMARKS, the Applicant argues as follows:

A) That: "rejection of claim 1 and 10 under US patent No. 6,339,570 to Kikuchi in view of US patent No. 6,584,048 to Tateishi et al, ...". [page 8, paragraph 3; REMARKS].

FIRST: It seems some typographical error was made on the part of Applicants, since Kikuchi 6,339,570 was never use for rejection. Kikuchi **6,353,582** was used and he does indeed disclose ALL the limitations as claimed so far in above claims.

SECOND: Tateishi does supply the missing teachings of calculation of focus error based on positive and negative peaks, and difference between peak point and sum signal as shown above.

THIRD: Even if it is assumed that Tateishi does not show what is being claimed, it can be shown that calculation of focus error signal based on positive and negative peak is well known as shown above and it can also be associated with thickness error as shown by US patent 6,031,792 [was sent before] which discloses thickness error detection based on difference between absolute value of negative and positive peak of focus error signal [see BSTX (17)].

B) That: "Tateishi eat al. Fig. 5B describes that the focus error position is determined to be in AREA 1 before the focus error signal takes a positive peak (that is a range of $t < t_3$ in the

horizontal axis), the focus position is determined to be in AREA 2 before the focus error signal takes a negative peak after it took the positive. ...But it is not described in Tateishi et al. that the substrate thickness is detected based on the $|v(t3)| - |v(t10)|$ " [page 8, paragraph 4; REMARKS].

FIRST: This is 103 rejection NOT 102. So it is obvious that Tateishi will not disclose what Kikuchi has been used for.

SECOND: Kikuchi was used for thickness detection. Tateishi was used for generating focus error signal. It seems that both are exactly doing what the examiner has indicated above in his rejection.

C) That: "USP 6,031,792 describes that focus error signal is detected without being influenced by a difference in substrate thickness" [page 8, paragraph 4; REMARKS].

FIRST: USP 6,031,792 was NOT used for any rejection at all.

SECOND: it was used to give idea that detecting focus error based on peak values positive and/or negative is nothing new and is not patentable. Other arts were also shown doing the same thing. For example:

[see US patent 5,136,566; col. 4, lines 1-11. Also see US 4,974,220; col. 4, lines 10-42 and fig. 3]. Especially US patent 6,031,792 which discloses thickness error detection based on difference between absolute value of negative and positive peak of focus error signal [see BSTX (17)].

Allowable Subject Matter

7. NOTE: Claims 5-9, 12-15 are allowable over the prior art of record since the cited references taken individually or in combination fails to particularly disclose an optical disk device which includes a controller for calculating a compensating factor for the spherical aberration "at each radial position of the disk based on the thickness errors of the transparent substrate detected at various radial positions on the optical disk prior to recording or reproducing information, and causing the spherical aberration compensator to compensate based on the compensation factors during recording or reproducing".

Art Unit: 2627

It is noted that the closest prior art, Kikuchi, US patent 6,353,582 shows a similar apparatus, which has a controller for calculating compensation for spherical aberration. However Kikuchi ['582] fails to disclose a compensating factor for the spherical aberration at each radial position of the disk based on the thickness errors of the transparent substrate detected at various radial positions on the optical disk prior to recording or reproducing information, and causing the spherical aberration compensator to compensate based on the compensation amount during recording or reproducing.

8. Applicant's amendment necessitated the new grounds of rejection presented in this office action. Accordingly, **THIS ACTION IS MADE FINAL**. See M.P.E.P. § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 C.F.R. § 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Contact information

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gautam R. Patel whose telephone number is 571-272-7625. The examiner can normally be reached on Monday through Thursday from 7:30 to 6.

The appropriate fax number for the organization (Group 2600) where this application or proceeding is assigned is 571-273-8300.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Dwayne Bost, who can be reached on (571) 272-7023.

Any inquiry of a general nature or relating to the status of this application should be directed to the Electronic Business Center whose telephone number is 866-217-9197 or the USPTO contact Center telephone number is (800) PTO-9199.



GAUTAM R. PATEL
PRIMARY PATENT EXAMINER

Gautam R. Patel
Primary Examiner
Group Art Unit 2627

August 29, 2007